

Draft Scope of Work

Columbia River Initiative Economic Analysis

DRAFT: April 18, 2003

Proposed Study Team:

Dan Huppert, Professor, University of Washington
Others to be determined by Dr. Huppert

Expected Time Frame:

Draft report due by end of October 2003
Final report to be completed by mid December 2003

Rationale:

Competition for water from the Columbia River continues to escalate. There are hundreds of pending applications in Washington for new water rights from the Columbia, and there is little agreement on the stream flows needed to support salmon. The purpose of the Columbia River Regional Initiative is to develop an integrated state program that will allow access to the river's water resources while providing adequate protection for endangered salmon.

The initiative will result in rule-making to establish a new water management program for the Columbia River that defines how the Department of Ecology will carry out its dual obligations to allocate water and preserve a healthy environment. To do this appropriately, Ecology is currently seeking scientific advice regarding the risks to salmon recovery generated by out-of-stream uses of water and the extent to which these risks can be offset by active management. The Initiative also includes a review of water use efficiency.

Expected products from the Initiative include: 1) a new rule that establishes a state program for managing new and existing water uses from the river, including permit review procedures and water-use efficiency incentives and requirements; 2) an agenda of actions needed to enhance water supply (access and reliability) and to address the needs of fish; and, 3) a related funding program to cover the costs of any necessary mitigation projects.

In addition to the reviews of science and water use efficiency, a study of the economic values of water use, including values associated with preservation of instream uses, will be completed. The purpose of this study is to develop economic data on water use from the mainstem of the Columbia River to inform water allocation and management decisions. The Department of Ecology will use the information generated by the study, along with other information developed by the Columbia River Initiative, to prepare a draft management program for public review. The data developed by the study will assist the department to meet statutory requirements to maximize net benefits to the public derived from water allocation decisions (RCW 90.03.005 and 90.54.020). Data will also be used to satisfy the requirements of the Administrative Procedures Act (cost benefit analysis) and the Regulatory Fairness Act (small business economic impact).

Study Approach:

The study team will conduct a review of existing economics literature to: 1) establish the value of water for both instream and out-of-stream uses; 2) show differences in cost versus return for a set of management scenarios; 3) describe the likely distributional effects of costs and returns (e.g. by business sectors, public and private, etc.); and, 4) Distinguish between likely short and long-term economic impacts.

Because of the short time frame available for the study and the limitations of the budget, the team will rely primarily on existing literature to generate its report. This existing work will be used to draw conclusions/implications regarding the issues associated with the Columbia River Initiative. To the maximum extent feasible the study team will employ conventional and professionally recognized methods and peer reviewed and recognized authoritative sources. When there are compelling reasons to depart from such methods and sources the rationale for their use will be explained.

New modeling and/or research is not anticipated as a part of the review.

To guide the work of the study team, it is expected that the Washington State Department of Ecology (Ecology) will provide a set of draft management scenarios describing amounts of water to be allocated and the various conditions under which this might occur.

To provide a vehicle for public participation in the study process, an Economics Advisory Committee (EAC) composed of interested stakeholders will be established by the Department of Ecology. The EAC will be convened twice. At the outset of the review, an EAC meeting will be held to provide input regarding the existing literature resources available to the study team. A second EAC meeting will be held once a draft report has been generated to solicit input from the group.

Issues and Work Plan:

1. Irrigated Agriculture

Contained within the boundaries of the Columbia Basin project and elsewhere in the basin there are substantial acreages for which agricultural development is technically feasible. In this subsection the study team's task is to look at the value of using water for new irrigation development. As previously discussed, the study team would build on studies done by others. The study team would rely on its own knowledge as well as guidance from the EAC to identify potential sources of information. Where it is feasible the study team will update existing study results to present and anticipated future conditions.

There are several related issues:

- a. How much irrigation relying on the Columbia River exists within Washington? What crops are grown? At what cost? And with what value? How much water is used to grow these crops?
- b. What are the net economic effects of bringing new lands under irrigation?

2. *Municipal and Industrial*

The cities along the Columbia have historically relied upon the river as a source of water supply. The study team will attempt to determine the value of water for such uses.

Records of water purchases for municipal and industrial use in the region and elsewhere will be used to provide evidence of cities willingness to pay for water. The study team will consider studies in other states that compare the economic return per unit of water used from agriculture with the returns generated by municipal uses. In addition, the study team will describe a recent case study that illustrates the value water might have in municipal and industrial uses.

3. *Hydropower*

The study committee will examine the potential effects that the out-of-stream use of water would have on hydropower generation. The study team will rely on the Department of Ecology to provide management scenarios that describe the amount of water used, and the likely points of diversion.

4. *Flood control*

The study team will examine the effect the out-of-stream use of water would have on flood control. The study team will rely on the Department of Ecology to provide management scenarios that describe the amount of water used, and the likely points of diversion.

5. *Navigation*

The study team will evaluate the potential for any effects on navigation to occur. It is assumed that effects would occur only if water diversions were sufficient to lower the pools by an amount that would interfere with normal barge draft, or result in inadequate water for lockage.

6. *Endangered Species Recovery*

Whenever water allocation is discussed in the Columbia Basin, the potential effects on endangered species are raised as a concern. The risk to salmon survival resulting from the diversion of water from the river is the topic of the National Academy of Sciences (NAS) study currently underway. However, because the NAS review is not due to be completed until early next year the study team will rely upon management scenarios provided by the Department of Ecology that attempt to describe the range of likely outcomes from the NAS review.

The use values and non-use values of the listed species (primarily salmon and steelhead) are addressed separately under points 6 and 8 below. However, there are several other ways that reallocating water out-of-stream might have an economic effect on endangered species:

- a. The diversion of this water might have a marginal negative effect on species recovery. This could prolong the recovery period, perpetuating the costs of recovery.
- b. The negative effects from diverting this water could make necessary other mitigating recovery measures somewhere else in the system, with cost consequences.
- c. The last reasonably healthy salmon population on the Columbia is located within the study area on the Hanford Reach. If the delivery or use of water were to damage that population, the economic costs would be considerable.

7. Recreation and Commercial Fishing

There is a significant amount of water-based recreation and commercial activity that could be affected by reallocation of water. Reservoir boating and sport harvest of resident fish could be affected. Sport and commercial harvest of anadromous fish could also be affected.

The study team will estimate the marginal impact on these activities from the amount of water withdrawals proposed in Ecology's management scenarios. Relationships documented in the Corps of Engineers Lower Snake EIS study may help the study team to discuss the likely nature and magnitude of these economic impacts.

8. Statewide and secondary effects

Items 1 through 7 above should focus on the direct economic effects on these uses of water. Decision makers will also be interested in how these impacts propagate into income and employment effects in Washington and the more directly affected sub-area. The study team will also distinguish between short and long-term impacts and consider distributional impacts, e.g. who gains and who loses by sector.

As stated above, the study team is not expected to build any new regional models for this study, but will rely on existing sources of information.

9. Passive use

One of the more contentious issues addressed in the Corps of Engineers Lower Snake EIS study was the quantification of what might be called passive use, non-use, or existence values associated with alternative scenarios for the Lower Snake River. The same issues confront us about the impacts of alternative uses of water in the mainstem Columbia. In this case, the issues are whether the out-of-stream use of water will have some marginal effect on salmon survival and thus have existence value, and whether marginal flow changes in the lower river affect its aesthetics (etc.) and thus a non-market value.

Using available sources of information, the study team will describe the issue and its possible magnitude. A contingent valuation study that would attempt to quantify these effects is beyond the scope of this study.

10. Water Markets

Would a water market be a useful tool for managing the Columbia River? What conditions are necessary to support a market for water? How could a market be implemented?

The study team will describe the conditions necessary to support a water market for the mainstem of the Columbia River, and comment on what steps must be taken to implement a water market in the short run.

There is an extensive literature related to the design, benefits, and limitations of water markets.

Project Budget – Funding Issues

A total of \$100,000 is available from the Washington State Department of Ecology for this study, including the public participation process described above.